IN THE CLAIMS:

Please amend claims 1 and 63 as follows.

1. (Currently Amended) A method for performing positioning in a radio system, the method comprising:

transmitting at least one identifier signal to at least two different channels, each identifier signal being suited for channel estimation,

receiving, in a receiver, said at least one identifier signal through at least two different channels,

estimating, based on ~~the basis of~~ the at least one received identifier signal from the at least two different channels, a spatial signature of the channels, and

defining, based on ~~the basis of~~ the spatial signature, information related to the location of a receiver or a transmitter of the at least one identifier signal.

2. (Previously Presented) A method as claimed in claim 1, further comprising defining, as the information related to the location, at least one direction between the receiver and transmitter based on the spatial signature of the signals.

3. (Previously Presented) A method as claimed in claim 1, further comprising defining the information related to the location by comparing an estimated spatial

signature with known spatial signatures and defining, as the location, a position whose known spatial signature is closest to the estimated spatial signature.

4. (Previously Presented) A method as claimed in claim 1, further comprising transmitting the identifier from at least two different antenna elements in order to transmit the identifier signals to at least two different channels.

5. (Previously Presented) A method as claimed in claim 1, further comprising defining the information related to the location according to the map coordinate system when the location of at least the transmitter or receiver is specified in a map coordinate system.

6. (Previously Presented) A method as claimed in claim 1, further comprising forming the spatial signature by utilizing several channel estimate matrices generated at different time instants.

7. (Previously Presented) A method as claimed in claim 1, further comprising forming the spatial signature by utilizing several channel estimate matrices generated on different frequencies.

8. (Previously Presented) A method as claimed in claim 1, further comprising forming the spatial signature by utilizing several channel estimate matrices calculated from different reception antennas.

9. (Previously Presented) A method as claimed in claim 6, further comprising generating from different channel estimates at least one covariance matrix of at least one channel and forming the spatial signature based on at least one specific vector of the covariance matrix.

10. (Previously Presented) A method as claimed in claim 6, further comprising generating a singular value decomposition for a channel estimate matrix, by means of which specific value vectors of the covariance matrix are defined for the definition of the information related to the location.

11. (Previously Presented) A method as claimed in claim 9, further comprising defining a first dominant delay path by utilizing specific values of the channel covariance matrix calculated for different delay paths or the channel singular values in such a manner that the dominant delay path is the path having the highest specific value energy.

12. (Previously Presented) A method as claimed in claim 9, further comprising defining a first delay path whose specific value energy exceeds a predefined threshold value.

13. (Previously Presented) A method as claimed in claim 1, further comprising utilizing additionally in the positioning at least one of the following measurements:

defining the direction of arrival as a DOA measurement,

defining the angle of arrival as an AOA measurement,

for the purpose of comparing the direction of reception and transmission with each other.

14. (Previously Presented) A method as claimed in claim 1, further comprising utilizing additionally in the positioning at least one of the following measurements:

measuring the time of arrival as a TOA measurement,

measuring the time difference of arrival as a TDOA measurement,

for the purpose of defining the distance between the transmitter and receiver.

15. (Previously Presented) A method as claimed in claim 1, wherein in the receiving of said at least two identifier signals, the identifier signals are at least partly uncorrelated.

16. (Previously Presented) A method as claimed in claim 1, wherein in the receiving of said at least two identifier signals, the identifier signals are orthogonal.

17. (Previously Presented) A method as claimed in claim 1, further comprising using the elements or parameters of the channel estimate corresponding to the shortest delay in the spatial signature of the signals.

18. (Previously Presented) A method as claimed in claim 1, further comprising generating the identifier signals in such a manner that the signals are transmitted from the different antenna elements at different time instants.

19. (Previously Presented) A method as claimed in claim 1, further comprising generating the identifier signals by coding the signals to be substantially non-interfering to each other.

20. (Previously Presented) A method as claimed in claim 1, further comprising generating the identifier signals by transmitting the signals on different frequencies.

21. (Previously Presented) A method as claimed in claim 1, wherein in the receiving of said at least two identifier signals, a terminal serves as the receiver and performs its own positioning.

22. (Previously Presented) A method as claimed in claim 21, further comprising signalling necessary information on the antenna structure or antenna element location of the base station to the terminal.

23. (Previously Presented) A method as claimed in claim 1, further comprising signalling the spatial signatures or the parameters of the spatial signatures of the received signals to a base station and defining the location of the terminal in the network part of the radio system.

24. (Previously Presented) A method as claimed in claim 1, further comprising using one or more base stations in defining the location of the terminal.

25. (Previously Presented) A method as claimed in claim 1, further comprising calculating the received power based on the spatial signature of the signals and maximizing the received power in relation to the transmission direction for the purpose of defining the information related to the location between the transmitter and receiver.

26. (Previously Presented) A method as claimed in claim 1, further comprising estimating, by the terminal, the location of the unit transmitting the identifier signal.

27. (Previously Presented) A method as claimed in claim 1, wherein the identifier signals are broadcast signals.

28. (Previously Presented) A method as claimed in claim 27, wherein the identifier signals are common pilot channel signals of a WCDMA radio system.

29. (Previously Presented) A method as claimed in claim 1, wherein the identifier signals are channel-specific training sequences.

30. (Previously Presented) A method as claimed in claim 1, wherein the identifier signals are transmitted on a dedicated channel.

31. (Previously Presented) A radio system configured to perform positioning the radio system comprising:

a transmitter;

a receiver;

at least one base station; and

wherein the transmitter comprises an antenna comprising at least two antenna elements

the transmitter is configured to transmit at least one identifier signal to at least two different channels, each identifier signal being suited for channel estimation,

the receiver is configured to receive said at least one identifier signal,

the receiver is configured to estimate, on the basis of the at least one received identifier signal from the at least two different channels, a spatial signature of the channels, and

wherein in the radio system, positioning is configured to define, based on the spatial signature, information related to the location of a receiver or a transmitter of the at least one identifier signal.

32. (Previously Presented) A radio system as claimed in claim 31, wherein the radio system is further configured to define, as the information related to the location, at least one direction between the receiver and transmitter based on the spatial signature of the signals.

33. (Previously Presented) A radio system as claimed in claim 31, wherein to transmit the identifier signals to at least two different channels, the transmitter is further configured to transmit the identifier signal from at least two different antenna elements.

34. (Previously Presented) A radio system as claimed in claim 31, wherein the radio system is further configured to compare an estimated spatial signature with known spatial signatures and to define, as the location, a position whose known spatial signature is closest to the estimated spatial signature.

35. (Previously Presented) A radio system as claimed in claim 31, wherein in the radio system the location of the transmitter or receiver is specified in a map coordinate system, the radio system is further configured to define the information related to the location according to the map coordinate system.

36. (Previously Presented) A radio system as claimed in claim 31, wherein in the radio system, the receiver is further configured to form the spatial signature by utilizing several channel estimate matrices generated at different time instants.

37. (Previously Presented) A radio system as claimed in claim 31, wherein in the radio system the receiver is further configured to form the spatial signature by utilizing several channel estimate matrices generated on different frequencies.

38. (Previously Presented) A radio system as claimed in claim 31, wherein in the radio system the receiver is further configured to form the spatial signature by utilizing several channel estimate matrices calculated from different reception antennas.

39. (Previously Presented) A radio system as claimed in claim 36, wherein in the radio system, the receiver is further configured to generate from different channel

estimates at least one covariance matrix of at least one channel, and to form the spatial signature based on at least one specific vector of the covariance matrix.

40. (Previously Presented) A radio system as claimed in claim 36, wherein in the radio system, the receiver is further configured to generate a singular value decomposition for a channel estimate matrix, and wherein the receiver is further configured to define specific value vectors of the covariance matrix for the definition of the information related to the location.

41. (Previously Presented) A radio system as claimed in claim 37, wherein the radio system is further configured to define a first dominant delay path by utilizing the specific values of the channel covariance matrix calculated for different delay paths or the channel singular values, and the radio system is further configured to define as the dominant delay path the path having the highest specific value energy.

42. (Previously Presented) A radio system as claimed in claim 37, wherein the radio system is further configured to define a first delay path whose specific value energy exceeds a predefined threshold value.

43. (Previously Presented) A radio system as claimed in claim 31, wherein the radio system is further configured to utilize in the positioning at least one of the following measurements:

a DOA measurement of the direction of arrival,

an AOA measurement of the angle of arrival,

for the purpose of comparing the direction of reception and transmission with each other.

44. (Previously Presented) A radio system as claimed in claim 31, wherein the radio system is further configured to utilize in the positioning at least one of the following measurements:

a TOA measurement of the time of arrival,

a TDOA measurement of the time difference of arrival,

for the purpose of defining the distance between the transmitter and receiver.

45. (Previously Presented) A radio system as claimed in claim 31, wherein the identifier signals are at least partly uncorrelated.

46. (Previously Presented) A radio system as claimed in claim 31, wherein the identifier signals are orthogonal.

47. (Previously Presented) A radio system as claimed in claim 31, wherein the identifier signals are broadcast signals.

48. (Previously Presented) A radio system as claimed in claim 47, wherein the identifier signals are common pilot channel signals of a WCDMA radio system.

49. (Previously Presented) A radio system as claimed in claim 31, wherein the identifier signals are channel-specific training sequences.

50. (Previously Presented) A radio system as claimed in claim 31, wherein the identifier signals are transmitted on a dedicated channel.

51. (Previously Presented) A radio system as claimed in claim 31, wherein the radio system is further configured to use the elements corresponding to the shortest delay in the spatial signature of the signals.

52. (Previously Presented) A radio system as claimed in claim 31, wherein the base station is further configured to transmit the identifier signals from the different antenna elements at different time instants.

53. (Previously Presented) A radio system as claimed in claim 31, wherein the base station is further configured to code the identifier signals to be non-interfering to each other.

54. (Previously Presented) A radio system as claimed in claim 31, wherein the base station is further configured to transmit the identifier signals on different frequencies.

55. (Previously Presented) A radio system as claimed in claim 31, wherein the terminal is the receiver and adapted to perform its own positioning.

56. (Previously Presented) A radio system as claimed in claim 55, wherein necessary information on the antenna structure or antenna element location of the base station are signalled to the terminal.

57. (Previously Presented) A radio system as claimed in claim 31, wherein the terminal is further configured to signal the spatial signatures or the parameters of the spatial signatures of the received signals to the base station and to define the location of the terminal in the network part of the radio system.

58. (Previously Presented) A radio system as claimed in claim 31, wherein the radio system is further configured to use one or more base stations in defining the location of the terminal.

59. (Previously Presented) A radio system as claimed in claim 31, wherein the radio system is further configured to calculate the received power based on the spatial signature of the signals, and to maximize the received power in relation to the transmission direction for the purpose of defining the information related to the location.

60. (Previously Presented) A method for performing positioning in a radio system, the method comprising:

transmitting, from a transmitter, at least one identifier signal to at least two different directions, each identifier signal being suited for channel estimation related to the different directions,

receiving, in a receiver, said at least one identifier signal transmitted through at least two different directions,

estimating, based on the at least one received identifier signal from the at least two different directions, a spatial signature of the channels, and

defining, based on the spatial signature, information related to the location of a receiver or a transmitter of the at least one identifier signal.

61. (Previously Presented) A radio system comprising:

a transmitter;

a receiver; and

at least one base station;

wherein the transmitter comprises an antenna having at least two antenna elements,

the transmitter is configured to transmit at least one identifier signal to at least two different directions, each identifier signal being suited for channel estimation related to the different directions,

the receiver is configured to receive said at least one identifier signal transmitted to different directions,

the receiver is configured to estimate, based on the at least one received identifier signal from different directions, a spatial signature of the channels, and

wherein in the radio system, positioning is configured to define, based on the spatial signature, information related to the location of a receiver or a transmitter of the at least one identifier signal.

62. (Previously Presented) A transmitter in a radio system, the transmitter comprising:

an antenna having at least two antenna elements; and

wherein the transmitter is configured to transmit at least one identifier signal to at least two different channels for a receiver to receive the at least on identifier signal, to estimate a spatial signature of the channels based on the at least one identifier signal received from the at least two different channels, and for positioning a receiver or a transmitter of the at least one identifier signal in the radio system based on the spatial signature.

63. (Currently Amended) A base station in a radio system, the base station comprising:

an antenna having at least two antenna elements, and

wherein the base station is configured to transmit at least one identifier signal to at least two different channels for a receiver to receive the at least on identifier signal, to estimate a spatial signature of the channels based on the at least one identifier signal received from different channels, and for positioning the receiver or the base station ~~bsed~~ based on the spatial signature.

64. (Previously Presented) A receiver in a radio system, wherein the receiver is configured to:

receive at least one identifier signal transmitted from a transmitter having an antenna with at least two antenna elements to at least two different channels,

estimate, based on the at least one identifier signal received from at least two different channels, a spatial signature of the channels for positioning a receiver or a transmitter of the at least one identifier signal.

65. (Previously Presented) User equipment in a radio system, wherein the user equipment is configured to:

receive at least one identifier signal transmitted from a transmitter having an antenna with at least two antenna elements to at least two different channels,

estimate, based on the at least one identifier signal received from at least two different channels, a spatial signature of the channels for positioning the user equipment or the transmitter.